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SUNFLOWER: A LITERATURE SURVEY

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PREFACE

This bibliography includes references to material on various aspects of sunflower (Helianthus annuus) cultivation and utilization both in the United States and abroad. It contains listings of books and articles on the growth and uses of the sunflower and on the production of sunflower oil and its by-products.

Since this was intended to be a general survey of the available literature, no attempt has been made at selectivity.

Call numbers following the citations are those used in the National Agricultural Library.

Compiled in the Division of Reference by Merne H. Posey.

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N. A. Ivanova, O. I. Al'binskaya and A. G. Neshchadim, joint authors.

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Sunflower oil.

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Sunflower oil.

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N. A. Ivanova, O. I. Al'binskaya and A. G. Neshchadim, joint authors.

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114. BENETSKAIA, G. K. Contribution to the knowledge of the biology of the flowering of the sunflower. (In Russian.) Agrobiologia 1960(2):266-267. Mar./Apr. 20 Ag822

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German summary.

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S. Apetroaei, I. Miha, and M. Eftimescu, joint authors.

Wheat and sunflowers in Rumania.

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T. Halmos, A. Koranyi, and G. Kozma, joint authors.

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Sunflower oil was used in the experimental diet.

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G. Karman De Sutton, P. Cattaneo, and J. G. Gomez Artero, joint authors.

English summary.

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E. G. Paramonova, V. K. Zikeeva, and K. M. Karataev, joint authors.

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Sunflower meal was fed to chicks in this experiment.

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Weed control.

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French summary.

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Industry.

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G. Azovtsev, P. Ivarovskii, and A. Leunova, joint authors.

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Sunflower, peanut, and soybean oilmeals.

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Equipment.

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Equipment.

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Sunflower was among the plants used in the tests.

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Water relation study of sunflowers, Taxus cuspidata and Rhododendron roseum.

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Includes discussion.

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O. Ya. Kurtsin', A. V. Popova, and L. F. Roshchina, joint authors.

English summary.

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Helianthus annuus test plant.

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English summary.

Indoleacetic acid.

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Sunflower is one of the crops discussed as an ingredient in a pumpkin silage mixture.

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Argentina.

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English summary.

The former caused by a species of Phoma and the latter of uncertain origin.

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English summary.

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C. Tesu, G. Lixandru, and E. Merlescu, joint authors.

French summary.

Soil properties.

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Sunflower and peas were used in experiments.

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Sunflower is included in the crops discussed.

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Chiefly as an oil crop.

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English summary.

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Sunflower cuttings were unable to develop roots in the absence of boron.

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English summary.

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English summary.

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Oil-water emulsions of sunflower oil were studied.

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Sunflower pectin is included.

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Sunflower cv. Peredovik has an exceptionally high oil content while Commander has a higher percentage of seeds.

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Irrigated area in South Alberta in 1962 planted to sunflower was 2000 acres.

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English summary.

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Sunflower oil was one of 16 vegetable oils tested.

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199. CASALLO, A., and RODRIGNEZ, F. The Russian sunflower (new oil plant). (Sp) Agricultura [Madrid] 32(374):341-345. June 1963. 15 Ag84

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English summary.

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N. Onu, Gh. Sirbu, and M. Lazar, joint authors.

English summary.

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Sunflower, soybean and Coriandrum sativum seed treatment.

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Study was made of 7 preparations for disinfecting sunflower seeds against Botrytis cinerea.

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205. CHAMPION, R., and ANSELME, C. Study of fungus microflora in sunflower seeds in France (1962, 1963, 1964). (Fr) Oleagineux 21 (6):371-376. Ref. June 1966. 77.8 OL2

English summary, p. XLII.

Botrytis cinerea isolated.

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A sunflower oil emulsion was used in the process.

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V. Stefan, N. Dorobantu, D. Boti, G. Curticapeanu, and M. Botea, joint authors.

English summary.

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213. CHOPPIN DE JANVRY, J. The future of sunflower in France. (Fr) Oleagineux 17(10):771-775. Oct. 1962. 77.8 OL2

As oil plant.

214. CHUPAROVA, E., CHOBANOV, D., and POPOV, A. Quantitative analysis of fatty acids by liquid-partition chromatography. (Bul) Bulgar. Akad. Nauk. Inst. Org. Khim. Izv. 2:31-35. 1965.

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O. Bugnariu, V. Filipas, A. Rub-Saidac, and A. Popovici, joint authors.

218. CIOCANELEA, V., and others. Sunflower oil used in injectable oily solutions. Farmacia (Bucharest) 10:267-275. 1962.

E. Rosu, A. Rub-Saidac, I. Bugrariu, A. Popovici, and V. Filipas, joint authors.

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English summary.

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English summary.

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English summary.

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English summary.

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English summary.

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Sunflower as test plant.

Includes discussion.

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English summary.

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Policy.

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English summary.

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English summary.

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Sunflower as test plant.

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Sunflower and olive oils.

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Translation from Problemy Fotosinteza. Doklady.

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Effects of gamma rays.

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Chiefly culture.

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Sunflower seeds were tested.

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Chiefly planting.

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English summary.

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Sunflower seed oil was also tested.

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The industry.

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The iodine number was established for hydrogenated sunflower oil, among others.

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German summary.

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D. V. Sokol'skii, K. A. Zhubanov, and Yu. P. Klyushnikov, joint authors.

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Information on yields of sunflower is given.

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697. KOPEIKOVSKII, V. M., and KOSTENKO, V. K. Effect of speed of movement of the heat carrier on the speed of drying of sunflower seeds. (Rus) Masl.-Zhir. Promysh. 10:13-16. Oct. 1962. 307.8 M37

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Sunflowers.

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V. G. Shcherbakov, G. I. Garbuzova, M. I. Igol'chenko, M. I. Riazantseva, and N. L. Troianova, joint authors.

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The intensity of biochemical changes in sunflower seeds was determined by the temperature of drying.

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English summary.

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E. F. Likhonos, R. I. Ul'yanovskaya, and R. D. Likhovid, joint authors.

Sunflower seed hulls.

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Sunflower husks are discussed.

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Caused by Plasmopara halstedii.

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L. V. Romanova, E. Yu. Fal'k, and S. A. Chernomorskii, joint authors.

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V. M. Kopeikovskii, G. I. Garbuzova, N. S. Arutyunyan, and V. D. Kravets, joint authors.

717. KOSTENKO, V. K., and KOPEIKOVSKII, V. M. Effect of heat drying upon the changes in physiological-biochemical properties of oil-rich sunflower seeds. (Rus) Izv. Vysshikh Uchebn. Zavedenii, Pischevaya Tekhnol. 1962(5):103-108. 389.8 Iz8

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English summary.

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English summary.

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English summary.

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English summary.

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English summary.

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Caused by Plasmopara holstedii.

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734. KOZIN, N. I., and ERMAKOVA, P. M. The catalytic role of residues from oxydized oil. (Rus) Masl. -Zhir. Promysh. 1961(2):12-13. Feb. 307.8 M37

Sunflower oil.

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Sunflowers and cotton.

736. KOZIN, N. I., and SMOTRIN, A. A. The emulsification properties of pectin. Maslob. -Zhir. Prom. 29(5):14-16. 1963. 307.8 M37

Mixtures of 50-60 percent refined sunflower oil and 50-40 percent water containing from 0.5 to 1.5 percent pectin were emulsified by ultrasonic waves for 5 minutes.

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Conditions for obtaining two types of emulsions from sunflower oil and soybean oil were investigated.

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739. KOZIN, N. I., and SITNIKOVA, E. N. Influence of phosphatide in vegetable oils during storage. (Rus) Izv. Vysshikh Ucheb. Zavedenii, Pishchevaya Tekhnol. 1960(5):24-30. 389.8 Iz8

740. KOZIN, N. I., and SITNIKOVA, E. N. Moisture absorption by vegetable oils in relation to storage temperature and humidity and to phosphatide content. Saratov. Sara. Nauchn-issled. Sb. Nauchn. Robot. 1961(17):103-113. 41.9 Sa73

741. KOZIN, N. I., and MAKARENKO, E. N. Polymorphic changes in the fatty ingredients of margarine. Maslob. -Zhir. Prom. 30(3):17-19. 1964. 307.8 M37

Data on polymorphism in hydrogenated sunflower and whale oils are tabulated.

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Hydrogenated sunflower oil was one of the fats tested.

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745. KOZIN, N. I., and ERMAKOVA, P. M. Storage of sunflower in nitrogen. (Rus) Maslozhirovaya Prom. 9:3-5. 1965. 307.8 M37

Oil.

746. KOZIN, N. I., and MAKARENKO, E. N. Study of polymorphic transformations in fat aggregates in margarine from dilatometric data. (Rus) Mosk. Inst. Nar. Knoz. Tr. 1963(24):56-62.

Sunflower oil was one of three fat bases studied.

747. KOZIN, N. I., and SNEGIREVA, I. A. Utilization of phosphatide concentrates and of dry (skim) milk powder in the manufacture of mayonnaise. (Rus) Maslob. -Zhir. Prom. 30(9): 11-13. 1964. 307.8 M37

Viscosity, size-distribution of the sunflower oil globules.

748. KOZINKA, V., and KLENOVSKA, S. The uptake of mannitol by higher plants. Biol. Plant. 7(4):285-292. Ref. 1965. 450 B52

Barley and sunflower; includes excretions.

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Sunflower oil.

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Sunflower was used as a cover crop for Medicago falcata / Agropyron glaucum, and this combination gave the best results.

751. KRACHANOV, KH. G., and DIMITROV, D. Alkaline degradation of pectins. I. Viscosity comparisons of alkali-degraded sunflower and apple pectins. (Bu) Nauchni Tr., Visshiya Inst. Khranitelna Vkusova Prom.-Plovdiv 12(1):301-308. 1965.

752. KRACHANOV, KH. G., and others. Effect of some factors on gelling properties of sunflower pectin. (Rus) Zhur. Prikl. Khim. 37(9):2035-2043. Ref. Sept. 1964. 385 Z64

S. Stoikov, N. Lyutskanov, and V. Nikolova, joint authors.

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756. KRASTINA, E. E. The role of internal and external factors in diurnal rhythm of amino acid synthesis by sunflower roots. (Rus) Akad. Nauk SSSR, Inst. Fiziol. Rast. Rol Mineral'n. Elementov v Obmene Veschestv i Produktivnosti Rast. 1964:53-58.

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758. KRAVCHENKO, V. D., and OMEL'CHENKO, F. S. Viscosity of miscellae of sunflower oil in hexane. (Rus) Masl. Zhir. Promysh. 8:13-14. Aug. 1963. 307.8 M37

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760. KREMINSKII, V. Sunflower variety the Mayak. (Rus) Selek. Semenovodstvo 5:64. Sept./Oct. 1966. 61.9 Se5

761. KRETOVICH, V. L., and KASPEREK, M. Amino acids synthesis from pyruvic acid in different plants. Biokhimiya 26:592-596. 1961. 385 B523

762. KRETOVICH, V. L., and KASPEREK, M. Biosynthesis of amino acids from pyruvic acid and ammonia in rice and sunflower. (Rus) Fiziol. Rast. 8(6):663-668. Ref. 1961. 450 F58

English summary.

This journal will appear in English translation 450 F58Ae.

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Sunflower was one of the plants used.

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This article will appear in English translation in Doklady: biochemistry sections. (511 P444Aebc).

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766. KRETOVICH, V. L., MORGUNOVA, E. A., and STARODUBTSEVA, A. I. The effect of heating on the physiological and biochemical properties of sunflower seeds. (Rus) Masl.-Zhir. Promysh. 1960(2): 8-11. Feb. 307.8 M37

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D. V. Sokol'skii, K. A. Zhubanov, and N. K. Nadirov, joint authors.

768. KRUSSER, O. V., VALAKHANOVICH, A. I., and KHOLODOVA, G. V. The problem of an enriched medium for biosynthesis of streptomycin. (Rus) Leningr. Khim.-Farmatsevt. Inst. Tr. 1962(15): 143-152.

Sunflower oil and starch hydrolyzate were used instead of soybean oil and glucose.

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771. KRUZHILIN, I. P. Growing of sunflowers on irrigated lands of the Rostov Region. (Rus) Zemledelie 1962(4):40-45. Apr. 20 Z44

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773. KRYUKOVA, L. M., and KASYMOV, A. The role of radiotoxins in the disturbance of structure formation of irradiated plants. (Rus) Akad. Nauk SSSR Dok. 156(5):1204-1206. 1964. 511 P444A

Effect of X-rays on sunflowers.

774. KUKIN, V. F. Selection of sunflower varieties resistant to broomrape. (Rus) Zashch. Rast. ot Vred. i Boleznei 8:28-29. Aug. 1962. 421 Z1

775. KUKSIN, N. V., and BEGEL, S. V. After-harvest sowing of annual fodder crops in Carpathian Region and the forest-steppe of the Ukraine. (Rus) Agrobiologiya 1:79-81. 1960. 20 Ag822

Rootcrops, sunflower and grass mixtures were tested.

776. KUKSIS, A. Hydrocarbon composition of some crude and refined edible seed oils. Biochemistry 3(8):1086-1093. 1964. 381 B523

The hydrocarbon portions of sunflower oil, among others, were isolated on silicic acid and analyzed by gas chromatography.

777. KUL'NEVICH, V. G., and others. Role of oxygen in furfural production by a direct method. (Rus) Izv. Vysshikh Uchebn. Zavedenii, Pishchevaya Tekhnol. 1966(2):93-96. 389.8 Iz8

K. M. Kardailova, S. V. Abramyants, and N. S. Maksimenko, joint authors.

778. KUO, C. S., and WANG, F. H. The effect of coconut milk, casein hydrolysate and glutamine on the growth of the sunflower young embryos grown in vitro. (Ch) Acta Bot. Sinica 12(4):364-375. Ref. Dec. 1964. 450 C432

English summary.

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English summary.

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English summary.

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French summary.

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Flax, colza, and sunflower.

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English summary.

Chiefly effects of spacing and notrogen fertilizers on chemical composition of the seeds.

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English summary.

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English summary.

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English Summary.

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Review of culture.

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Includes chemical control.

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Sunflower oil was one of those tested.

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English summary.

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English summary.

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English summary.

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French summary.

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Equipment.

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1349. RHODESIA, NORTHERN. MINISTRY OF AFRICAN AGRICULTURE. Annual report including the reports of the Departments of Agriculture and Co-operatives and African Marketing for the year 1962. Lusaka, 1963. p. 28. 24 R343

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1358. ROBU, C., and others. The influence of exoxidized fatty di- and triesters on alkyd lacquer characteristics. (Rum) Bucharest. Univ. "C. I. Parhon". Analele, Ser. Stiint. Nat. 9(26):175-187. 1960. 512 B856

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Sunflower oil was used in one of the diets.

1470. SHERSHEVSKI, M. G. Effect of animal and vegetable fat on ketonemia in atherosclerosis. (Rus) Leningrad. Gos. Izd. Med. Lit. Sb. Ateroskleroz 1961, 178-180.

1471. SHERSTNEV, E. A., and KURILENOK, G. V. Effect of B on the quantitative content of free amino acids and on the incorporation of tyrosine-^{14}C into the proteins in sunflower. (Rus) Botan. Zh. 49(5):699-702. 1964. 451 R923

1472. SHERSTNEV, E. A., and RAZUMOVA, M. V. The effect of boron deficiency on the ribonuclease activity in young leaves of sunflower plants. Agrochimica 9(4):348-340. Sept.1965. 385 Ag84

1473. SHERSTNEV, E. A., and KURILENOK, G. V. Effect of boron on the inclusion of adenine-C 14 in the ribonucleic acid of leaves and roots of the sunflower plant. (Rus) Akad. Nauk SSSR. Dok. 142(5):1201-1202. Ref. Feb.1962. 511 P444A

This article will appear in English translation in Doklady: biochemistry sections (511 P444Aebc).

1474. SHERSTNEV, E. A., and KURILENOK, G. V. The effect of boron on the quantitative content of free amino acids and on the incorporation of C^{14}-tyrosine in proteins of sunflowers. (Rus) Bot. Zhur. [Moscow] 49(5):699-702. Ref. May 1964. 451 R923

1475. SHERSTNEV, E. A. The participation of boron in the metabolism of nucleic acids in plants. (Rus) Mikroelementy i Estestv, Radioaktivn. Pochv, Rostovsk. Gos. Univ. Materialy 3-go (Tret'go) Mezhvuz. Soveshch. 1961:110-111. Pub. 1962. 385 Uk74

The test plant was sunflower.

1476. SHIBAOKA, H. The mechanism of the growth-inhibiting, effect of light. Plant Cell Physiol. 2:175-197. 1961. 450 P699

Sunflower leaves were used in the experiments.

1477. SHIMANSKII, N. K. The culture of sunflowers for seed of high yields. (Rus) Selek. i Semen. 2:72-73. Mar./Apr. 1965. 61.9 Se5

1478. SHIMANSKII, N. K., LOSHAK, I. F., and FASTOVETS, L. S. The effect of fertilizers on the yield and oil content of sunflower seeds. (Rus) Agrobiologiya 1961(6):849-853. Nov./Dec. 20 Ag822

Ammonium sulfate, superphosphate, and potassium salts.

1479. SHIMANSKII, N. K., and LOSHAK, I. F. Increasing the productivity of sunflowers by directed cultivation. (Rus) Selek. i Semen. 1961(5):24-28. Sept./Oct. 61. 9 Se5

Chiefly fertilizing with nitrogen and irrigation.

1480. SHIMSHI, D. Effect of chemical closure of stomata on transpiration in varied soil and atmospheric environments. Plant Physiol. 38(6):709-712. Nov. 1963. 450 P692

Sunflower and tobacco were test plants.

1481. SHKEL', S. E. Intake of radioactive calcium by sunflower leaves depending on calcium supply of nutritive medium and age of plants. (Rus) Timiryazevskaya Sel'shokhoz. Akad. Izv. 32:135-148. 1960. 106 P44

English summary.

1482. SHKOL'NIK, M. M., KRUPNIKOVA, T. A., and DMITRIEVA, N. N. The auxin oxidase activity and auxin content in sunflower plants grown on media with and without boron. (Rus) In Akad. Nauk Ukr. SSR. Mikroelementy v sel'skom khoz. i med. p. 76-79. 1963. QH659 .A35

1483. SHKOL'NIK, M. YA., KRUPNIKOVA, T. A., and DMITRIEVA, N. N. Effect of boron deficiency on some auxin metabolism processes in sunflower and corn. (Rus) Fiziol. Rast. 11(2):188-194. 1964. 450 F58

1484. SHKOL'NIK, M. YA., and KOSITSYN, A. V. Effect of boron on the speed of the inclusion of P^{32} in the nucleic acids of the sunflower. (Rus) Akad. Nauk SSSR. Dok. 144(3):662-664. May 21, 1962. 511 P444A

This article will appear in English translation in Doklady: biological sciences sections (511 P444Aeb).

1485. SHKOL'NIK, M. YA., and MAEVSKAYA, A. N. Morphological changes in sunflower as a result of boron deficiency. 7 p. Ref. Transl. 14470

Translation from Nauchnye Doklady Vysshei Shkoly [Seriya]. Biologicheskie Nauki. 1:143. 1961.

1486. SHKOL'NIK, M. YA., and others. Morphological variation of plants under boron deficiency. (Rus) Soveshchanie po Morfogenezu Rast Trudy 1(2):13-16. Ref. 1959, pub. 1961. 451 So84

A. N. Maevskaya, M. M. Steklova, and V. N. Davydova, joint authors.

Tomatoes and sunflowers.

1487. SHKOL'NIK, M. YA., and MAEVSKAYA, A. N. Morphological variations in plants induced by boron deficiency. (Rus) Bot. Zhur. [Moskva] 45(6):805-811. Ref. June 1960. 451 R923

English summary.

Sunflowers.

1488. SHKOL'NIK, M. YA., and others. On the morphological variation of plants caused by boron deficiency. (Rus) Bot. Zhur [Moscow] 49(11):1584-1591. Ref. Nov. 1964. 451 R923

A. N. Maevskaya, V. P. Bozhenko, and Kh. A. Alekeeva, joint authors.

English summary.

Sunflowers.

1489. SHKOL'NIK, M. YA., and MAEVSKAYA, A. N. On the problem of the mechanism of the effect of boron on biosynthesis of nucleic acids. Effect of boron on energy metabolism. (Rus) Akad. Nauk SSSR. Dok. 145(1):222-224. Ref. July 1, 1962. 511 P444A

Effects on content of ATP in sunflowers.

This article will appear in English translation in Doklady: biological sciences sections (511 P444Aeb).

1490. SHKOL'NIK, M. YA., TROITSKAYA, E. A., and MAEVSKAYA, A. N. Reporduction with aid of 8-azoguanine of the morphological changes in sunflower due to boron deficiency. (Rus) Fiziol. Rast. 12(5):876-887. Ref. Sept./Oct. 1965. 450 F58

English summary.

Includes seed germination.

1491. SHKOL'NIK, M. YA., and MAEVSKAYA, A. N. Significance of boron in nucleic acid metabolism. (Rus) Fiziol. Rast. 9(3):270-278. Ref. 1962. 450 F58

English summary.

Of beans and sunflowers.

This journal will appear in English translation 450 F58Ae.

1492. SHKOL'NIK, M. YA., MAEVSKAYA, A. N., and SOLOV'EVA, E. A. The significance of boron in nucleic exchange. (Rus) Mikroelementy v SSSR 1:39-40. 1961. 385 M58

Experiments with beans and sunflowers.

1493. SHKOL'NIK, M. YA., and SOLOV'EVA, E. A. Studies in the physiological role of boron. I. Elimination of the deleterious effects of boron deficiency by supplying nucleic acid. (Rus) Bot. Zhur. [Moscow] 46(2):161-173. Ref. Feb. 1961 451 R923

English summary.

To nutrient solutions for sunflowers; includes review of the literature.

1494. SHKOL'NIK, M. YA. Trace elements and nucleic acids. (Rus) Biol. Nukleinovogo Obmena u Rast., Akad. Nauk SSSR, Bashkirsk. Filial, Materialy 2-oi (Vtoroi) Nauchn. Konf., Ufa 1962: 38-51. Pub. 1964.

The role of trace elements in nucleic acid synthesis is in activation of enzymes of nucleic acid metabolism and in fixing of macromolecular nucleic acid configuration. Boron deficiency inhibited nucleic acid metabolism in sunflower.

1495. SHPAKOVA, V. M. Chemical composition of pollen from several flowers and grapes. (Rus) Odessk. Gos. Univ., Biol. Fak. Nauchn. Ezhegodnik 1960(2):247-249. 511 Od2

Sunflower is included.

1496. SHTARK, P. N. Effect of minor elements on formation of nucleic acids in sprouts of cultivated plants (corn, proso, wheat, flax and sunflowers). (Rus) In Khimiz. sel'sk. k-va Orenburgsk. obl. 1964: 68-71. Not in Libr.

Abstracted in Ref. Zh. Biol. Khim. 24:122. Dec. 25, 1965. 241.7 R252

1497. SHTENBERG, A. I., and EREMIN, YU. N. Influence of fats containing large amounts of highly unsaturated fatty acids upon the thyroid gland condition in animals. (Rus) Vopr. Pitaniya 20(3):34-41. 1961. 389.8 V89

1498. SHUL'GIN, G. Increase the production of vegetable oil. (Rus) Kolkhoz.-Sovkhoz. Proizvodstvo 3:46-47. 1963. 20 So85

Sunflower oil.

1499. SHUSTROV, V. S. Application of mineral fertilizers while plowing. (Rus) Khim. Sel'skom Khoz. 4(11):13-14. Nov. 1966. 385 K524

Sunflowers and barley.

1500. SIDAK, R. N. Raising the level of scientific studies and improving methodology. (Rus) Vestnik. Sel'skohozjajstv. Nauk 1965(5):7-16. 20 V633

Breeding sunflower.

1501. SIEGEL, O., and SCHMIDT, H. L. Laboratory experiments and results of field trials on inoculation with Azotobacter [chroococcum]. (Ge) Landwirt. Forsch. 19(1):18-28. 1966. 18 L2333

English summary.

1502. SIETZ, F. G. Determination of volatile substances in fatty oils. (Ge) Seifen-Oele-Fette-Wachse 90:668. 1964. 307.8 Se4

1503. SILVEIRA GUIDO, A. Los insectos enemigos del girasol en el Uruguay [The insect pests of sunflowers in Uruguay]. Montevideo. Univ. Fac. Agron. Bol. 81, 64 p. Ref., p. 59-62. Nov. 1965. 102.5 M76B

1504. SILVEIRA-GUIDO, A. The principal insect pests of sunflowers in Uruguay. (Sp) Agr. de las Amer. 11(5):66-69; (6):48-50, 52, 70. Ref. May-June 1962. 58.8 Ag832

1505. SIMAKOV, P. V., and BRYKINA, G. V. Effect of different amounts of sunflower oil on urinary excretion of vitamin B_2 and C in children. (Rus) Vopr. Pitaniya 24(2):29-32. 1965. 389.8 V89

1506. SIMIC, B., SIMIC, A., AND MARKOVIC, R. Longitudinal investigations of the influence of diets of different caloric value, quantity and fat, and sodium chloride content on blood pressure, and the incidence of abnormal electrocardiograms in old people. Acta Med. Iugoslavica OTS 63-11456/2:34-49. 1964.

Sunflower oil was one of the vegetable oils used in the experiment.

1507. SIMIONESCU, C., CALISTRU, E., and SIMIONESCU, N. Chemical changes in developing tumors induced by Agrobacterium tumefaciens. (Rum) Rev. Chim. 6:235-243. 1961. 385 R3222

Changes in contents of lignin, cellulose, and substances soluble in 1 percent NaOH were followed in blades of healthy plants and in tumors induced by A. tumefaciens in tomatoes and sunflowers.

1508. SIMKO, V., and BUCKO, A. Biological effect of thermally treated fats. (Cz) Cesk. Gastroenterol. Vyziva 17:160-167. 1963.

Sunflower oil was fed to guinea pigs in this test.

1509. SIMKO, V., BUCKO, A., and ONDREJICKA, R. Chemical and physical changes in sunflower oil and hardened vegetable fat on heating. (Cz) Cesk. Gastroenterol. Vyziva 15:429-432. 1961.

1510. SIMKO, V., and others. Chemical and physical changes induced in food fats during the process of heating and their effect on the histological picture of guinea pig organs. Nutr. Dieta 6:91-105. 1963.

A. Bucko, J. Babala, and R. Ondreicka, joint authors.

The results of physical and chemical analyses of sunflower oil, among others exposed to 170° indicate that products harmful from the nutritional point of view may develop under ordinary conditions of kitchen processing.

1511. SIMKO, V., and BUCKO, A. Fat balance in guinea pigs kept on diets containing fresh and heated sunflower seed oil, and hydrogenated fat. Cesk. Gastroenterol. Vyziva 17:86-90. 1963.

1512. SIMKO, V., BUCKO, A., and BOBEK, P. The nutritional effect of fresh and heat-treated sunflower oil and hydrogenated edible fat on the spectrum of serum proteins and lipoproteins of guinea pigs. Vnitrni Lekar 8, 1075-1079. 1962.

1513. SIMONYAN, E. G. Nucleoli in the sunflower after fertilization. (Rus) Akad. Nauk Armyanskoi SSR. Izv. Biol. Nauk. 14(11):39-44. Nov. 1961. 20 Er4

1514. SIMPLE ways to harvest sunflower seeds. Organ. Gard. and F. 8(5):34-35. May 1961. 57.8 Or32

1515. SIMS, R. P. A., and MES, J. C. The effect of relative concentrations on the efficiency of separation of polar and nonpolar lipides by alumina column chromatography. Am. Oil Chemists' Soc. J. 38:229-231. 1961. 307.8 J82

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English summary.

1517. SINGH, D. J. C. Mode of action of simazine [2-chloro-4, 6-bisethylamino-S-triazine] in wheat and sunflower. Andhra Agr. J. 12(6): 220-221. 1965. 34.2 An4

1518. SINGH, D. J. C. Mode of action on simazine in wheat and sunflower. Diss. Abs. 26(6):3004. Dec. 1965. 241.8 M58

1519. SINSKAYA, E. N. Experiments on hybridization of sunflower plants differing in direction and intensity of their photoperiodic reaction. (Rus) Trudy po Prikl. Bot. Genet. i Selek. 36(2):229-250. 1964. 451 R92

English summary.

1520. SINSKAYA, E. N. On the phylogeny of cultivated sunflowers. (Rus) Leningrad. Inst. Rastvod. Prob. Populyatsii u Vysshikh Rast. Trudy 1:141-151. Ref. 1961. 463.8 L54

1521. SINSKAYA, E. N. Physiological analysis of sunflower variety populations. (Rus) Fiziol. Rast. 7(2):225-231. Ref. 1960. 450 F58

This journal will appear in English translation 450 F58Ae.

1522. SINSKAYA, E. N. A physiological analysis of varietal populations of sunflower. Fiziol. Rast. 7(2):186-191. 1960. 450 F58

1523. SLONOV, L. S. Effect of trace elements on certain physiological indexes of plants under saline conditions. Materialy 4-oi (Chetvertoi) Nauchn. Konf. Aspirantov. Rostov-on-Don: Rostovsk. Univ. Sb. 1962:243-245.

Sunflower was one of the crops studied.

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Russian and French summaries.

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French summary.

1526. SISAKYAN, N. M., KOBYAKOVA, A. M., and FILIPOVICH, I. I. Adenosinetriphosphatase(s) of the protoplasmic structures of plants. (Rus) Biokhimiya 28(6):1011-1017. 1963. 385 B523

Sunflower was one of the plants observed.

1527. SKELLON, J. H., and WINDSOR, D. A. Fatty acid composition of egg yolk lipids in relation to dietary fats. J. Sci. Food Agr. 13:300-303. 1962. 389.8 F7322

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1529. SKIPIN, A. I., ERMOLIN, S. S., and SHCHERBINA, K. P. The stabilization of phosphatides in sunflower oil and the production of salad oil. (Rus) Masl.-Zhir. Promysh 1960(8):28-30. Aug. 307.8 M37

1530. SKOGLEY, E. O., and DAWSON, J. E. Synthetic ion-exchange resins as a medium for plant growth. Nature 198:1328-1329. 1963. 472 N21

Sunflower was one of the crops grown in the medium.

1531. SKRIPNIK, G. Taking in consideration mistakes made last year. (Rus) Zakupki Sel'skokhoz. Prod. 9:26-27. Sept. 1966. 280.38 Z14

Sunflower production and purchasing.

1532. SLIWIOK, J. Detection of adulterant vegetable oils in olive oil by thin-layer chromatography. (Ge) Mikrochim. Ichnoanal. Acta 1965(2):294-296. 384 M58

Sunflower oil was one of those investigated.

1533. SLONOV, L. KH. Effect of trace elements on the physicochemical properties of biocolloids of protoplasm and on uptake of salts by plants under saline conditions. (Rus) Kabardino-Balkarsk. Gos. Univ. Uch. Zap. 1964(21):71-76

1534. SMIKALOV, N. A. Fats and fatty substances in mixed feeds for calves. (Rus) Zhivotnovodstvo 1961(1):66-68. Jan. 49 Z6

Phosphatides from sunflower waste.

1535. SMIRNOV, A. G. Morphological and physiological relationships between the stalks in a plant community and the significance of the relationships with respect to the community. (Rus) Moskov. Obscest. Ispyt. Prirody Otdel Biol. Bjull. 68(2):134-136. 1963. 511 M85

Sunflower was used in the tests.

1536. SMIRNOV, V. M. Solubility of fatty oils and fatty acids. (Rus) Vses. Nauchn.-Issled. Inst. Zhirov. Tr. 1960(20):178-199. 307.9 M85

1537. SMIRNOVA, R. I. Effect of desication on planting quality of sunflower seeds. (Rus) Selek. i Semen. 4:26-27. July/Aug. 1963. 61.9 Se5

1538. SMIRNOVA, R. I. Procedure that accelerates maturing of sunflower. (Rus) Maslob.-Zhir. Prom. 29(11):12-13. 1963. 307.8 M37

1539. SMIRNOVA, V. A. Production costs and yields of sunflowers and flax as affected by soil-climatic conditions. (Rus) Vses. Nauch.-Issled. Inst. Ekon. Sel'skogo Khoz. Dok. Soobshcheniya 21:122-141, map. 1964. 281.9 M852

1540. SMITH, D., and BUCHHOLTZ, K. P. Modification of plant transpiration rate with chemicals. Plant Physiol. 39(4):572-578. 1964. 450 P692
Sunflower and other crops.

1541. SMITH, J. E., and WAYGOOD, E. R. Enzyme-coenzyme relationships in glutamic acid metabolism of rust-infected sunflower cotyledons. Canad. J. Bot. 41(1):41-54. Ref. Jan. 1963. 470 C16C
Puccinia helianthi.

1542. SMITH, J. E. Glutamine synthesis in uredospores of Puccinia helianthi Schw. Canad. J. Microbiol. 11(2):381-383. Ref. Apr. 1965. 448.8 C162
Fungus disease of wheat and sunflower.

1543. SMITH, J. E. Mitochondrial transamination in sunflower hypocotyls. Biochim. et Biophys. Acta 57(1):183-185. Feb. 12, 1962. 381 B522

1544. SMITH, J. E., and WAYGOOD, E. R. Resolution of the apoenzyme and coenzyme of L-glutamic acid decarboxylase from sunflower cotyledons. Canad. J. Biochem. & Physiol. 39(6):1055-1059. Ref. June 1961. 470 C16E

1545. SOBOLEV, A. M. Enzymatic hydrolysis of phytin in vitro and in germinating seeds. (Rus) Fiziol. Rast. 9(3):334-341. Ref. 1962. 450 F58
English summary.
Wheat and sunflowers.
This journal will appear in English translation 450 F58Ae.

1546. SOBOLEV, A. M. Formation and accumulation of phytin in seeds. (Rus) Fiziol. Rast. 11(1):106-111. 1964. 450 F58
Sunflower seeds were among those studied.

1547. SOBOLEV, A. M. and RODIONOVA, M. A. Phytin synthesis by aleurone grains in maturing sunflower seeds. (Rus) Fiziol. Rast. 13(6):1090-1093. 1966. 450 F58

1548. SOBOLEVA, A. V. Effect of boron, cobalt, and manganese during separate and combined spray nutrition on the nitrogen and oil content of sunflower leaves and seeds. (Rus) Fiziol. Rast. 10(6):719-721. 1963. 450 F58

1549. SOBOLEVA, A. V. Oil accumulation in sunflower seeds in the process of their formation under the effect of top-dressing with boron and gibberellic acid. (Rus) Nauchn. Dokl. Vysshei Shkoly, Biol. Nauki 1966(1):145-147. 442.8 N22

1550. SOKOL'SKII, D. V., and ZHUBANOV, K. Hydrogenation of sunflower oil in a Vishnevskii autoclave on nickel-chromium catalyst. Met. i Khim. Prom. Kazakhstana, Nauchno-Tekhn. Sb. 1962(6):100-103.

1551. SOKOL'SKII, D. V., and ZHUBANOV, K. Investigations of catalysts for hydrogenation of fats in the Vishnevskii autoclave by intensive agitation. Kataliticheskie Reaktsii v Zhidkoi Faze, Akad, Nauk Zaz. SSR, Kazakhsk. Gos. Univ., Kazakhsk. Resp. Pravlenie Mendeleevskogo Obshchestva, Tr. Vses. Konf., Alma-Ata 1962:61-65 Pub. 1963.
Sunflower oil was used in the experiment.

1552. SOLOV'EVA-TROITSKAYA, E. A. Effect of ribonucleic acid on plants when applied to a boron-deficient medium. (Rus) Mikroelementy v Sel'sk.-Khoz. i Med. Sb. 1963:68-72. QH659 .A35

1553. SOME achievements in scientific plant production in the last twenty years. (Bu) Rasten. Nauk. 1(8):3-12. 1964. 64.8 R18
Sunflower is among the plants discussed.

1554. SOMOGYI, J. C., and KUNDIG, H. Stabilization of oils rich in polyene acids and other nutrient fats. Intern. Z. Vitaminforsch. 31:221-223. 1961. 384 Z324

1555. SOMOGYI, J. C., and KUENDIG-HEGEDUES, H. Stabilization of oils rich in polyunsaturated fatty acids and other dietary fats. (Ge) Mitt. Gebiete Lebensm. u. Hyg. 52:104-115. 1961. 389.9 Sw6

1556. SOOS, G. Sunflower production is profitable. (Hu) Magyar Mezogazdaság 16(3):9. Jan. 18, 1961. 19 M27

1557. SOROA Y PINEDA, J. M. DE. Comentarios sobre el cultivo del girasol. Agricultura [Madrid] 29(333):3-8. Jan. 1960. 15 Ag84

1558. SOUTH AFRICA. DEPT. OF AGRICULTURAL TECHNICAL SERVICES. Annual report, 1963. Pretoria, 1963. 106 p. 24 So863An

Sunflower research in South Africa is discussed, and the statement is made that a negative correlation has been found between height of plant and bushel weight.

1559. SOVIETS increased output and state purchases of both sunflowerseed and sugarbeets in 1966. For. Agr. 5(9):11. Feb. 27, 1967. A281.9 F76Fo

1560. SPAIN. INSTITUTO NACIONAL PARA LA PRODUCCION DE SEMILLAS SELECTAS (Madrid). Girasol [Sunflower]. Madrid, 1965. 4 p. SB299 .S9I5

Culture as oil plant.

1561. SPAIN. INSTITUTO NACIONAL PARA LA PRODUCCION DE SEMILLAS SELECTAS (Madrid). El girasol forrajero [Forage sunflower]. Madrid, 1965. 3 p. SB299 .S9I52

1562. SPARIN, V. I. Advanced techniques for growing sunflowers. (Rus) Zemledelie 1965(4):51. 20 Z44

1563. SPENNEMANN, F. The influence of environment on variety characteristics, sunflowers as an example. (Ge) Saatgut-Wirt. 15(12):352-355. Dec. 1963. 61.8 Sa1

1564. SPINOV, R. I. Regularities in the process of filtering of sunflower miscella. (Rus) Maslob.-Zhir. Prom. 30(5):5-10. 1964. 307.8 M37

Mathematical-theoretical.

1565. SPIROVA, M. Biology of pollination and fertilization of sunflower. (Bu) Viss. Selskostopan. Inst. G. Dimitrov Agron. Fak. Nauc. Trud. 13:63-73. 1964. 106.3 Se4N

1566. SPIROVA, M. Experiments on artificial induction of male sterility in sunflower. (Bu) Viss. Selskostopan. Inst. G. Dimitrov. Agron. Fak. Nauc. Trud. 16:145-157. 1965. 106.3 Se4N

1567. SPIROVA, M. On pollination and fertilization of some sunflower lines. (Bu) Rastenievudni Nauk. 3(2):3-11. 1966. 64.8 R18

English summary.

1568. SRECKOVIC, A., DELIC, I., and SARGIN, S. Extracted sunflower meal as protein source in concentrated mixtures for feeding growing and fattening pigs. (Se) Arh. Poljoprivredne Nauk. 18(59):115-125. 1965. 21.5 Y9

English summary.

1569. STAHLIN, A. Recent fodder plants in German fodder production. (Ge) Maataloust. Aikakausk. 36(1):22-37. Ref. 1964. 20 Su7M

1570. STAIKOV, G. Changes in growth, development, yields, and quality of planting material of early potatoes, corn, and sunflowers grown as interplanted crops. (Bu) Vissh Selskostopanski Inst. "Vasil Kolarov." Nauch. Tr. 14(1):179-187. 1965. 106.3 P72

German summary.

1571. STANCULESCU, C., ILLE, C., and DUMITRESCU, M. Research on the behavior of refined sunflower oil deposited in large metal tanks. (Rum) Bucharest. Inst. de Cercet. Aliment. Lucrarile 5:99-108. 1961. 389.9 R86

French summary.

1572. STARCK, J. R., TRUOG, E., and ATTOE, O. J. Availability of boron in soils and that adsorbed on anion exchange resins. (Pol) Roczniki Gleboznawcze 13(2):431-438. 1963. 56.8 R592

Sunflower plants in pots filled with sand and various forms of boron were used to determine the amounts of boron taken up by sunflower.

1573. STARCK, J. R. Effect of boron on the cell walls structure of sunflower (Helianthus annuus). Soc. Bot. Pol. Acta 32(3):619-623. 1963. 450 Ac89

1574. STARCK, J. R. Effect of boron on the mineral ion and water uptake by plants. Pol. Towarzystwo Bot. Acta. 31:357-378. 1962. 451 Sol2

1575. STARCK, Z. Influence of derootment on the translocation of photosynthates. Soc. Bot. Pol. Acta 33(4):759-771. 1966. 450 Ac89

The reaction of sunflower and bean plants to derootment is investigated.

1576. STARCK, Z. Relation between translocation of ^{14}C-assimilates and growth rate of sunflower, lupine and bean plants. Acad. Polon. Sci. Bull. Ser. Sci. Biol. 14(5):359-365. Ref. 1966. 512 W262

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German summary.

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English summary.

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English summary.

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English summary.

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